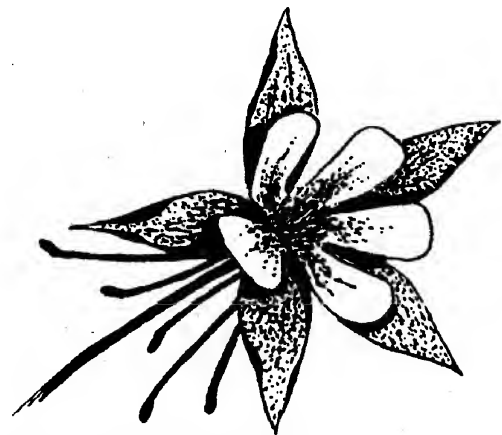


Aquilegia

Newsletter of the Colorado Native Plant Society

"... dedicated to the appreciation and conservation of the Colorado native flora"



Volume 18 Number 4

July/August 1994

The Endangered Species Act Still Needs Your Help

Tamara Naumann Conservation Committee

The Senate Committee on Environment and Public Works has been holding hearings this summer on reauthorization of the Endangered Species Act (ESA). A hearing on scientific rationale for conserving species was held on June 15 (see article on pharmacological importance of native plants on page 6); on June 22, the role of federal agencies and federal lands in conservation of threatened, endangered and declining species was examined; and the importance of conserving threatened and endangered species on private lands was explored on July 19. Hearings are scheduled for August 9 and September 20 to address the lag in development and implementation of recovery plans for listed species and to discuss strategies for preventing species endangerment.

The Endangered Species Coalition (ESC), a group of environmental and conservation organizations dedicated to a strengthened ESA, is sponsoring regional grassroots conferences on the ESA in September and October. While none of these conferences is scheduled to take place in Colorado, there is much you can do to support reauthorization of a strong Act. Write to Senators Hank Brown and Ben Nighthorse-Campbell, and to your Representative; express support for the Action Agenda developed by the Endangered Species Coalition (see page 7). Ask them to oppose any bills that would weaken the Act, such as the Tauzin "Property

Rights" Bill (HR 3875) which would require government reimbursements to private landowners when the presence of endangered species limits their development

3997) also seek to weaken the protection given to endangered species.

The ESC is working with scientists who are willing to speak up at scientific meetings to update their colleagues about Endangered Species Act issues. A packet of information on both the Act and lobbying techniques is being prepared. If you are interested in helping in this way, contact Faith Campbell, Natural Resources Defense Council, 1350 New York Avenue, N.W., Washington, DC 20005, to request a copy of the packet.

If you would like additional information to help you in your letter writing, contact the Endangered Species Coalition, 666 Pennsylvania Avenue, S.E., Washington, DC 20003. Volume 17 No. 3 of *Aquilegia* also contained an informative article on ESA reauthorization by Nina Williams.

The Endangered Species Act may be *endangered* without your help. This legislation is extremely important for native plant conservation. The time to ACT is now!



Erigeron kachinensis
Artist: unknown

rights. The Pombo "Endangered Species Management Act of 1994" (HR 3978), and the Doolittle "Balanced Economic and Environmental Priorities Act of 1994" (HR



Contents

Annual Meeting	2	ESA Tips	7
Announcements	3	Federal Plant Policies	8-9
Gentians	4	A New Species!	11
Field Notes	5	Calendar	12
Biodiversity and You	6		

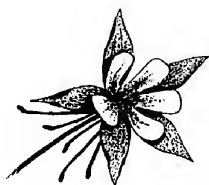
1994 Annual Meeting

Mark your calendars NOW for another exciting CONPS Annual Meeting: October 15, 1994, at the University Park Holiday Inn in Fort Collins. Karen Mancini, chair of the Fort Collins Chapter planning committee, reports that arrangements are well in-hand for an exciting meeting that will focus on the Colorado Prairie. The committee, which includes Susie Gordon, Sue Martin, Micki McNaughton, Mike Scott, Myrna Steinkamp, and Renée Rondeau, has planned a full-day event that will begin with your choice of a morning field trip to a local prairie natural

area, or a botanical workshop. Following will be a wide-ranging program of slide presentations, beginning with an anthropologists' overview of 10,000 years of Native American utilization of the Colorado Prairie, and ending with talks on restoration of prairie ecosystems. In between will be presentations illustrating prairie ecosystems and plants, and botanically-centered views of animal and human effects on prairies. A noon luncheon will be available, with sign-up and payment required in advance. Of course, many popular features

of past annual meetings will be included in the 1994 event, including book sales, exhibits, officer elections, and the "after-glow" or post-meeting adjournment to a popular local spot where those so inclined will continue to visit about the meeting topic. (*Editor's note:* Fort Collins is famous for its brewpubs!) Watch your mail about mid-September for a special flyer that will bring full details about the meeting, together with registration form and sign-up for luncheon. Get ready for another fun-filled educational day with old and new Colorado Native Plant Society friends...October 15th.

Colorado Native Plant Society



The Colorado Native Plant Society is a non-profit organization dedicated to the appreciation and conservation of the Colorado native flora. Membership is open to all with an interest in our native plants, and is composed of plant enthusiasts both professional and non-professional.

Please join us in helping to encourage interest in enjoying and protecting Colorado's native plants. The Society sponsors field trips, workshops and other activities through local chapters and statewide. Contact the Society, a chapter representative, or committee chair for more information.

Schedule of Membership Fees

Life.....	\$250
Supporting	\$ 50
Organization	\$ 30
Family or Dual	\$ 15
Individual	\$ 12
Student or Senior	\$ 8

Membership Renewal/Information

Please direct all membership applications, renewals and address changes to the Membership Chairperson, Colorado Native Plant Society, P.O. Box 200, Fort Collins, CO 80522. Please direct all other inquiries regarding the Society to the Secretary at the same address.

Aquilegia

Aquilegia is published four to six times per year by the Colorado Native Plant Society. This newsletter is available to members of the Society and to others with an interest in native plants. Contact the Society for subscription information.

Articles from *Aquilegia* may be used by other native plant societies or non-profit groups if fully cited to author and attributed to *Aquilegia*.

Newsletter Contributions

Please direct all contributions to the newsletter to:

Tamara Naumann
940 Quinn Street
Boulder, CO 80303

Short items such as unusual information about a plant, a little known botanical term, etc. are especially welcome. Camera-ready line art or other illustrations are also solicited.

Please include author's name and address, although items will be printed anonymously if requested. Articles submitted on disks (IBM or Mac) are appreciated. Please indicate word processing software and version.



Officers

President	Tom Ranker	492-5074
Vice-President	Janet Hughes	933-2425
Secretary	Mark Gershman	443-9365
Treasurer	Myrna Steinkamp ..	226-3371

Board of Directors

Ann Armstrong (95)	Boulder	494-0545
David Buckner (95)	Boulder	494-3231
Janet Coles (95)	Boulder	440-0595
Mark Gershman (94)	Boulder	443-9365
Andrew Kratz (95)	Lakewood	238-6317
Tamara Naumann (95)	Boulder	440-8933
Chris Pague (94)	Lyons	492-4719
Tom Ranker (94)	Boulder	492-5074
Velma Richards (94)	Englewood	794-5432
Nina Williams (94)	Boulder	499-9858

Chapter Presidents

Boulder	Lynn Riedel	666-6687
Metro-Denver	Jeff Dawson	722-6758
Fort Collins	Mike Scott	490-1788
Yamparika	Reed Kelley	878-4666
San Juan	Gretchen Van Reyper	835-3268
Southwest	Sandy Friedley	884-9245
or	Leslie Stewart	882-7241

Committees

Conservation	Sally White	697-5439
Editorial	Tamara Naumann ..	440-8933
.....	Nina Williams	499-9858
.....	William A. Weber ..	492-6171
Education	Andrew Kratz	238-6317
Field Trips	Rick Brune	238-5078
.....	Jeff Dawson	722-6758
Field Studies	Mary Edwards	233-8133
Hort/Restoration ..	Tina Jones	794-2647
.....	Ann Armstrong	494-0545
Legislative Affairs ..	Nina Williams	499-9858
Membership	Myrna Steinkamp ..	226-3371
.....	Sue Martin	226-3371
Publicity	VACANT	
Workshops	Susan Eubank	277-9458
.....	Carol Dawson	722-6758
.....	Barbara Siems	838-6973

ANNOUNCEMENTS

Applied Plant Creativity: Graphic Artist Needed

The Society's **Rocky Horror Horticultural Show** is being revamped for next season. If you have graphic skills—hard copy or computer—to share, we'd like to hear from you. We're looking for an artist to create title and credit slides, as well as several graphics symbolizing weeds in an exciting and memorable way. If you can help, please call Bobbie Henig at (303) 297-9762.



Caltha leptosepala
Artist: O.V. Kirkton

New Artwork

We are pleased to announce that *Aquilegia* is beginning to reproduce artwork originally published in Francis Ramaley's *Colorado Plant Life*, a 1927 semicentennial publication of the University of Colorado. Also included in this issue are drawings from the federal publications: *Utah Endangered, Threatened and Sensitive Plant Field Guide* and *Range Plant Handbook*.

Newsletter Contributions

The *Aquilegia* editorial committee always appreciates receiving material from CONPS members. The 1994 schedule is set up to produce six issues: Jan./Feb., Mar./April, May/June, July/Aug., Sept./Oct., and Nov./Dec. Deadline for submissions is the first day of the first month of the issue, for example: September 1 for the Sept./Oct. to issue. Sometimes this deadline is flexible; call Tamara Naumann (440-8933) or Nina Williams (499-9858) for details. We would love to hear about your summer field trips and other activities!

Florissant Fossil Beds Silver Anniversary Seminar Series

In celebration of the 25th Anniversary of the Florissant Fossil Beds National Monument, the Friends of the Florissant Fossil Beds, Inc. has been presenting a summer series of day-long field seminars conducted in the natural classroom setting of the Florissant Valley and Pikes Peak region. Each seminar is led by an expert in the field and class size will be small. The cost is minimal and any proceeds will go to "The Friends," a non-profit group established to help the Monument protect the world class fossils and educate the public about their significance. For more details about registration, reservations, and cost, please call the Monument at (719) 748-3253.

HISTORY OF THE GOLD BELT *

August 27, Doris Wolfe

ROCKS OF AGES

September 3, Bill Dexter

STORYTELLING

September 10, John Stansfield

LIFE HISTORY OF THE ELK

September 17, Jack Vayhinger

* designed especially for families

(Editor's Note: Colorado Native Plant Society members worked from 1981-1988 creating an herbarium collection of the Monument's flora. The collection is currently housed at the Pike's Peak Research Station, awaiting the building of the new Florissant Visitor Center.)

Aquilegia

is printed on
100% recycled paper

Creating a Naturalist's Notebook: A Field Study at Lory State Park

Draw on the wild side! Draw wildflowers, wild animals and wild landscapes on a mini-tour of Lory State Park near Fort Collins, Colorado. Biologist Gary Raham and geologist Herb Saperstone will guide you in creating entries in your field notebooks, and point out the exciting features of a unique ecotone where prairie and foothills collide. In a few short hours you can make the circuit from sandstone hogbacks, grasslands, and fence lizards, to a granite peak dressed in ponderosa pine and Douglas-fir that is home to numerous mountain wildflowers, deer, small mammals, reptiles and an occasional black bear.

This course is designed for scientists, teachers, naturalists, artists, or anyone who wants to see how art and science can work beautifully together to serve both education and self enrichment.

Dates: September 15 (7-9:30pm)
September 17 (8 am to 4pm, Lory Park)
September 22 (7-9:30 pm)

Tuition: \$68 plus \$8 fee (\$76 total)

For more information contact:
The Division of Continuing Ed.
Colorado State University
(303) 491-5288
Ask about course DCE 0415

A Tale of Two Gentians

Carolyn Crawford
Bill Jennings
William A. Weber

The Pennsylvania "Dutch" have a saying that taxonomists should remember: "We get so soon old and so late schmart!" In preparing for the workshop on gentians, Carolyn Crawford came to the herbarium and soon began to sweat over the variability of what Bill Weber had been calling (for almost 50 years!) *Pneumonanthe affinis*. Bill W. recalled that when he first came to Boulder in 1946 this plant was blooming profusely around Chautauqua all through September and most of October. Carolyn said she couldn't believe that this is the same species that she had been seeing in South Park. Bill replied that he had worried about this too, but had never really studied the situation. Bill Jennings began to pull the folders out and sort over the various variations and soon had two piles: one of plants of dry situations at lower altitudes (no higher than 8,000 ft.) blossoming in September and October, and one of plants found in fens at higher altitudes and blooming in August. As we worked along we discovered that these were not at all the same thing! Before long, we had found so many qualitative characters separating these that it was obvious one of them must have been described under another name. The differences are summed up below.

Species A: the lower altitude, late-flowering plant, grows in dry areas, has many pairs of narrowly lanceolate leaves in a clearly decussate arrangement; the inflorescence is a very dense cluster of chalk-blue flowers that are narrow at each end; the calyx has prominent, very narrow, elongate lobes that, together with a conspicuous pair of narrow bracts beneath each flower, give the flower cluster a spiky appearance; and the pleats of the corolla at the upper end, where they meet the lobes, are studded with little "blisters", almost teeth. In life the plant is green.

Species B: the higher altitude, earlier-flowering plant, grows in wet meadows, has relatively few pairs of elliptic leaves, not as clearly decussate; the inflorescence is a loose

cluster of deep blue-purple flowers that are more distinctly funnel-shaped and broadest at the top; the calyx rarely has any well-developed lobes, and the floral bracts are inconspicuous; the lower flower clusters usually have an elongate peduncle and the

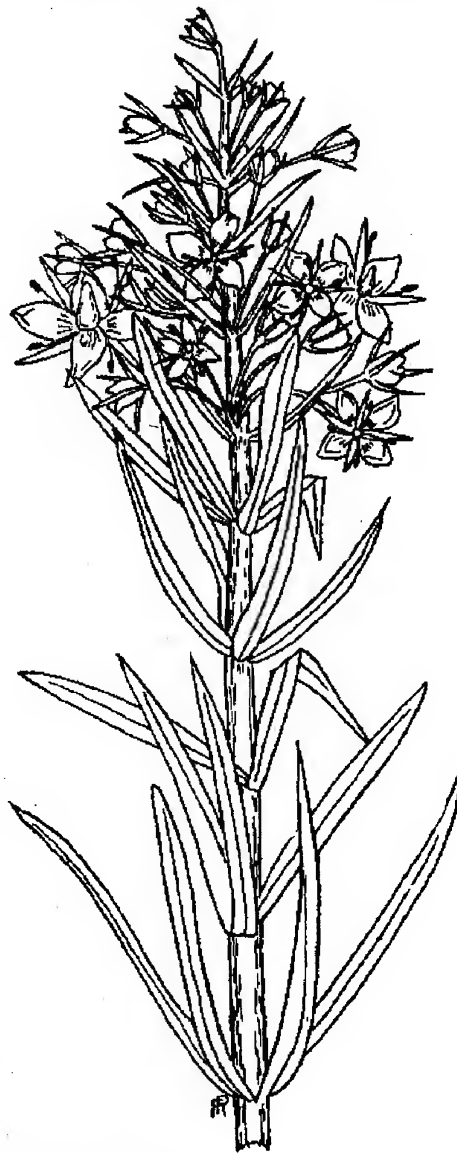
the high altitude where it grows.

The flowers themselves are quite different, judging from our examinations of fresh plants. In Species A, the corolla is 2.5 cm long, the anthers 3 mm long, the corolla transversely puckered inside, the petals 3 mm wide, with straight sides. In species B, the corolla is 2.2 cm long, the anthers 1.5 mm long, the corolla smooth inside, the petals 4.5 mm wide, broadly ovate, with rounded sides.

Species A, we determined, is clearly *Pneumonanthe affinis* Grisebach ex Hooker, described from British Columbia from a collection of Thomas Drummond. It ranges south to Colorado and Utah. What is species B? We soon found that Asa Gray described this from Arizona specimens and noted that it occurred in new Mexico and Colorado. He named it *Gentiana* (now *Pneumonanthe*) *bigelovii*. In fact, he mentioned all of the characters that we have noted above! What happened to this species in the manuals?

Rydberg, as one might expect, recognized both species (under the generic name *Dasystephana*), and added a few others (*D. forwoodii* and *D. interrupta*) based on the variability of the development of the sepal lobes (a notoriously variable character in gentians) and the looseness of the inflorescence. Harrington recognized *G. forwoodii*, *G. affinis*, and *G. bigelovii*. Dorn's *Wyoming Flora* reduced *G. bigelovii* to a variety of *G. affinis*, which is hardly justified. But nobody since Gray seems to have noticed the striking characteristics of the flower color, the curious crimps or teeth on the plaits, or the seasonal and altitudinal differences!

The lesson here is: no matter who you read, and how they agree or disagree, you should feel free to question and see for yourself on the basis of the whole gamut of characteristics, morphological, seasonal, and ecological. The Flora of Colorado is not settled simply by the publication of books; the books are just the beginning of learning.



Frasera speciosa
 Artist: Francis Ramaley

internodes of the inflorescence are longer, so that the flowers are not very densely clustered; and the pleats of the corolla are completely smooth from top to bottom. In life the stems are purple, possibly because of the greater production of anthocyanins at



FIELD NOTES

William A. Weber
Ron C. Wittmann

Despite the terribly dry summer season, a few interesting things have shown up in our plant presses. In retirement, the pressure for making collections is off, and one has more time to look at things more carefully in the field. The result is sometimes embarrassing. Two or three trips were made to the sites where *Dicentra uniflora* was found long ago. The season was perfect; all of the associated plants were in place, but we never found the plant. On the chance that we could find a likely locality by way of a paved road, we drove up the Blue Mountain plateau north of Dinosaur. Again, no *Dicentra*, although we were fortunate to find out that *Ranunculus jovis* was extremely abundant everywhere at the edge of melting snowbanks. This plant was overlooked by all of the surveys of Dinosaur National Monument because one needs to get out very early in the spring to see it. Evidently the collector of *Dicentra* did a lot of walking through the sagebrush, and we were not so patient.

In July we drove to McClure Pass to see if we could find *Melica subulata*, which has been discovered there recently. Again, we drew a blank. However, we took a small dirt road along the crest of the pass, winding through nice aspen groves toward a church camp. At one point, through the car window I spotted a plant that I took to be possibly *Micranthes odontoloma*. It had a very slender raceme of white flowers, and I could not see the leaves. Ron got out and exclaimed that it was not that species, but *Anticlea elegans*! We stopped the car, got out, and began to look at the plant carefully. It was obvious that it was an *Anticlea*, but hardly *A. elegans*! The stem was very slender; the bracts were slender, short, and inconspicuous, the petals were much smaller than typical for *elegans*, and the slender pedicels were spread out at right angles to the stem, and curved downward. The lower, perfect flowers were on branches of about 3 flowers; the rest were on solitary pedicels and were staminate.

What could this be? Well, I recalled that Rydberg had described a number of species

of *Anticlea*, all of which have been reduced to synonymy by the various floras. However, I recalled a species of *Anticlea* that I had met with in Mexico and that shared some of these characters. The Mexican species, *A. virescens*, has a more well-developed panicle, and the uppermost flowers, rather than the lower ones, are perfect. This species ranges north into Arizona and New Mexico. I then consulted Rydberg, and found that he called our McClure Pass plant *Anticlea coloradensis*, the type having come from (believe it or not) Idaho Springs. Next summer we should spend more time examining the distribution and ecology of our two Colorado species; in the meantime, it is quite obvious that we should pay more attention to *Anticlea*, and to our old discredited friend Per Axel Rydberg.



We made a trip to the Great Sand Dunes to determine whether a *Penstemon* collected long ago by Ramaley might be a relative of *P. haydenii* of the Sand Hills of Nebraska. That species inhabits blowout crests of dunes, is strongly rhizomatous (it can move with the sand). The leaves of the first year shoots are linear, those of the second year (flowering) being broadly lance-ovate; and the flowers are densely massed, larger than those of *P. angustifolius*, and very fragrant! We could only find *P. angustifolius*, and assume the Ramaley specimen belongs there. But botanists ought to search for *P. haydenii* in the sand hills of northeastern Colorado; it just might be there.

Along the road between McClure Pass and Kebler Pass, on the lower reaches just above Coal Creek, we found an *Aster* that was very

distinctive. It formed big rounded clumps, many stems arising together, and slender stems with panicles of heads with pale violet ray-flowers. What caught the eye more than the habitus was the fact that the outer phyllaries were as long as the inner, and were green from top to bottom, and relatively blunt at the tips. This turns out to be *Aster eatonii*, which has always been somewhat problematical here in Colorado, usually confused with *A. (Virgulaster) ascendens*, probably the most common roadside aster all over the Colorado mountains. That, however, is low, strongly rhizomatous, and has graduated phyllaries with pale lower margins. In *A. foliaceus*, a similar species with long and broader outer phyllaries, is also a low-growing plant of high altitudes. It's wonderful to suddenly learn something after having accepted the status quo for years!

Just north of the highway between Canyon City and Pueblo and just east of the county line there is a short-grass plains flat with a gypsum substrate. This is the only place where we have been able to find the Texas grass, *Scleropogon*. It forms little patches a few centimeters high, with a bluish cast. With a little practice it is easy to distinguish from the blue grama that is everywhere. *Scleropogon* is dioecious or nearly so. The female plants have spikelets with long awns, the male lack them; sometimes plants occur that are partly male and female. While we were examining the *Scleropogon*, we found a *Sporobolus* that superficially resembled a very small *S. cryptandrus*. However, the leaves were very short and stood out at right angles from the stem. This turned out to be out first authentic record of gypgrass, *Sporobolus nealleyi* Vasey. Associated with this was another rare grass, *Muhlenbergia arenacea*, known from a few places in southeastern Colorado. The field hardly supports grazing, and a corner of it is used for storing road material. The grasses are restricted to less than a square mile, along which the road goes up north to a military firing range. This site should be considered at least for monitoring and, if possible, for preservation.



Biodiversity and You

Medicinals Derived From Plants and Drugs Used In The Treatment Of Heart And Circulatory Problems

**Prepared by Natural Resources
Defense Council for the Endangered
Species Coalition—January 1994**

(Editor's Note: Supporters of the Endangered Species Act are often asked "Why protect this insignificant and ugly species?" In an effort to help the public better understand the value of protecting biological diversity, the Endangered Species Coalition (ESC) has been compiling and disseminating information on the benefits to people of "obscure" species. The piece includes excerpts from a series entitled *BIODIVERSITY AND YOU* produced by the ESC. You are encouraged to share this information with others and to use it in your communications with your representatives in Congress as we work for a renewed and strengthened Endangered Species Act.)

In 1991, more than 923,000 Americans died of heart disease or stroke. Heart disease and stroke will cost the health care system an estimated \$128 billion in 1994 (Associated Press). Many treatments of heart and circulatory diseases were derived originally from chemicals produced by plants. These chemicals evolved in plants as defenses mechanism against predation, parasites, and competition from other plants.

I. PRINCIPAL USE DRUGS

Drug names: **Digitalis, Digitoxin and Digoxin**

Original Plant Sources: Foxglove (*Digitalis purpurea* and *Digitalis lanata*—Scrophulariaceae) from Europe (Grever; Farnsworth; Gilman)

Plants: Digitalis and certain other cardiac glycosides are found in a number of plants and, in a few cases, the venom of some toad species. Digitalis is from dried leaves of the foxglove plant (*D. purpurea*), but seeds and leaves of other *Digitalis* species, such as *D. lanata*, also contain active cardiac chemicals. (Gilman)

Medicinal: Digitalis is most frequently used for patients with congestive heart failure to improve circulation. Digitalis works to increase both the rate and power of heart muscle contractions.

Digitalis is also used to slow rapid contractions of the upper chambers of the heart when the resulting rapid rate causes great discomfort, reduces cardiac work capacity, and may lead to heart failure. (Gilman; Hussar)

History: Modern study of digitalis began in 1785, when William Withering published a book entitled *An Account of the Foxglove and Some of Its Medical Uses: With Practical Remarks on Dropsy and Other Diseases*. Withering recognized that the plant "has power over the motion of the heart to a degree yet unobserved in any other medicine..." In the early 20th century, others established digitalis for the treatment of atrial fibrillation. (Gilman)

Drug name: **Verapamil** (derived from papaverine)

Original Plant Source: Opium poppy (*Papaver somniferum*—Papaveraceae) from southern Asia (Hollman)

Medicinal: Verapamil is a vasodilator and is used in treating high blood pressure and suffocating pain of the heart. It is also used to treat a rapid heart rate caused by abnormal function of the upper chambers. (Gilman)

Drug name: **Reserpine**

Original Plant Source: Snakeroot (*Rauvolfia serpentina*—Apocynaceae) from India (Gilman)

Plant: *Rauvolfia serpentina* is a climbing shrub indigenous to India that is listed in Appendix II of The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). This Appendix includes species that are not necessarily threatened at present but may become so if trade is not regulated.

Medicinal: Studies performed in the 1960s involving reserpine were critical in demonstrating that drug treatments could

treat hypertension. Reserpine's usage has since declined due to its effect on the central nervous system. However, comparative studies show that low doses of reserpine combined with a diuretic are as tolerable as combinations of a diuretic and other more expensive drugs such as propranolol or methyldopa. (Gilman)

Drug name: **Warfarin sodium**

Original Plant Source: Yellow sweet clover (*Melilotus officinalis*—Fabaceae) (Gilman; Hollman)

Medicinal: A synthetic compound, made from the naturally occurring substance, dicumarol, works to reduce or block blood clotting. At low doses it is useful in preventing clots in individuals with artificial heart valves or those who develop clots in leg veins. Such clots can cause death if they break loose and travel to the lungs, heart (Hussar) or brain.

-continued page 11



Melilotus officinalis
Artist: Gene Walker

Strengthening the Endangered Species Act in 1994: An Action Agenda

Tips for writing to your representatives, prepared by the *Endangered Species Coalition*
666 Pennsylvania Ave., SE · Washington, DC 20003 · 202-547-9009 · 202-547-9022 fax

1. Getting Ahead of the Extinction Curve

To prevent species from becoming endangered in the first place, Congress should:

- establish a national inventory of biological resources and identify ways to protect them;
- provide greater protection for species that are candidates for listing; grant the same protection to threatened and endangered plants on federal lands that is given to other listed species, and strengthen enforcement of plant protections; and
- restructure federal programs that currently subsidize destruction of biological resources to instead encourage long-term sustainable environmental and economic stability.

2. Saving Endangered Habitat and Ecosystems—Congress should:

- move to fulfill the ESA's original purpose of conserving ecosystems, as well as individual species, by putting greater emphasis on saving habitats and ecosystems; and
- ensure that critical habitat is designated and protected to further the survival and recovery of threatened and endangered species.

(The primary reason species become endangered is habitat destruction. Yet, according to the General Accounting Office, as of 1991, critical habitat was not designated for 84% of threatened and endangered species.)

3. Recovering Species From the Brink of Extinction—Congress should:

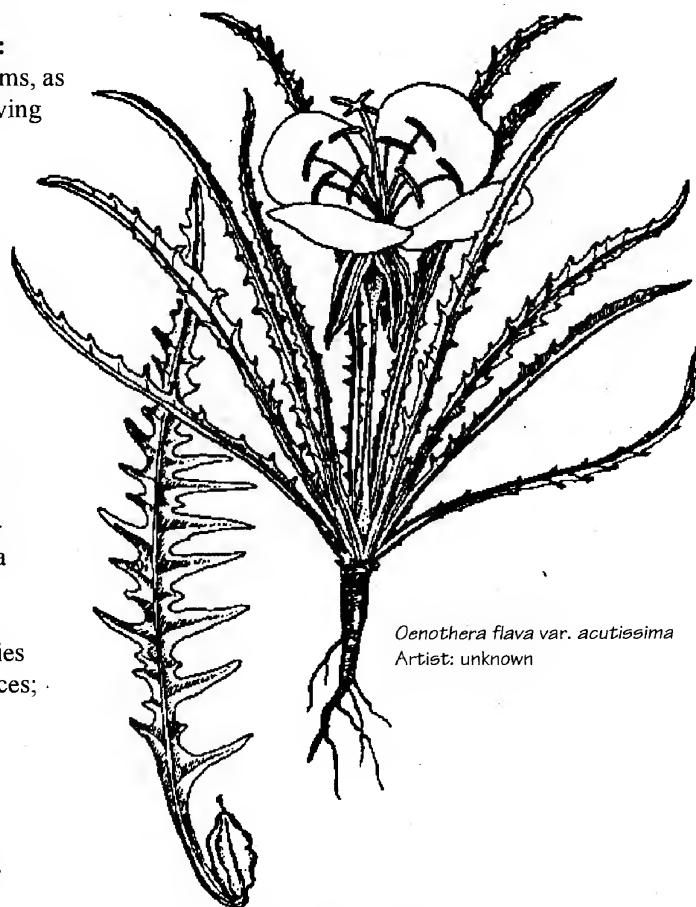
- require the development and implementation of integrated multi-species recovery plans to better protect ecosystems containing a number of listed or candidate species;
- seek the assistance and cooperation of state fish & wildlife agencies in the recovery plan process and inventories of biological resources; and
- set a two year deadline for completion of recovery plans.

4. Investing in America's Biological Heritage—Congress should:

- significantly increase appropriations to implement the ESA;
- provide financial incentives to private landowners who go beyond mere compliance with the ESA and actually promote the recovery of listed or candidate species; and
- establish a revolving loan fund to finance the development and implementation of habitat conservation plans.

5. Closing the Legal Loopholes—Congress should:

- clarify that federal agencies have the same duties under the ESA whether their activities take place inside or outside the U.S.;
- ensure that private citizens have the right to go to court immediately in emergencies to enforce the ESA;
- authorize the Secretary of the Interior to seek damages for destruction of endangered species and their habitats, and;
- stiffen the penalties for ESA violations.



Oenothera flava var. *acutissima*
Artist: unknown



Forest Service Responds to Colorado Environmental Coalition: Ecosystem Management and Sensitive Plants

**Tom L. Thompson, Deputy Regional Forester
USDA Forest Service, Rocky Mountain Region**

I want to take this opportunity to clear up misunderstandings that may have resulted from an article by Rocky Smith titled, "The Forest Service and Ecosystem Management: Are Sensitive Plants Falling Through the Cracks?" in the May/June 1994 issue of *Aquilegia*.

Ecosystem management is the use of an ecological approach to land management that blends social, physical, economic, and biological needs and values to assure productive, healthy ecosystems. By healthy ecosystems, we mean those in which structure and functions allow the maintenance of biological diversity, biotic integrity, and ecological processes over time. Ecosystem management is still evolving, and the Rocky Mountain Region (Region 2) of the USDA Forest Service is a national leader in the effort.

In Region 2, ecosystem management includes "coarse filter" and "fine filter" components. While the coarse filter focuses on broader vegetation, soil and water patterns, the fine filter focuses on rare habitats, plus endangered, threatened, proposed and sensitive species. These rare species are considered as "weak links" in the ecosystem. Helping to recover listed species, and preventing the need for future listings under the Endangered Species Act, are two important ways we measure success in maintaining healthy ecosystems.

Biological diversity assessments are now being developed to provide a context for Forest decisions. These assessments include analysis of fine filter elements using information supplied by natural heritage programs and through interviews conducted by the Forest Service with people having a wide range of expertise (state and federal employees and retirees, academicians, members of the public, etc.).

Sensitive plants in Region 2 were designated

based on criteria developed by a team of botanists representing The Nature Conservancy and natural heritage programs from all five states in the Region. Most plants designated as federal candidates (C1 & C2) by the US Fish & Wildlife Service (FWS) were included by these criteria, but about a dozen were not. Last March, we revised our sensitive plant list in response to a letter from the Chief of the Forest Service asking all Regional Foresters to include federal candidate species occurring on

status).

Proposed species are those which have been officially proposed by the FWS for listing as threatened or endangered under the Endangered Species Act (ESA). There are typically very few "proposed" species at any given time in the Rocky Mountain Region; currently, only one animal species is proposed. The reason we do not designate proposed species as "sensitive" is that we treat them with even greater concern. As required by direction in the Forest Service Manual (FSM 2671.44), we treat proposed species nearly the same as if they were already listed under the ESA, requiring Biological Assessments for both proposed and listed species. The difference in the way we deal with listed versus proposed species is in the level of formality in our communication with FWS: "consultation" is required for agency actions that may have an adverse effect on a federally listed species or designated critical habitat, whereas a "conference" is required on agency actions likely to jeopardize proposed species or adversely modify critical habitat that may be designated for such species. In contrast, there is no requirement for communication with the FWS regarding sensitive species. Designation as sensitive for a species which has already been proposed for federal listing would not provide any additional protection, but might actually confuse the issue if the proposed species were treated under official direction for sensitive species (which does not include conferencing with the FWS).

To summarize, we intend to help recover any listed or proposed species affected by Forest Service activities by working closely with the FWS (and other organizations or agencies). Furthermore, we intend to prevent the need for future listings through our sensitive species program. This program is a "proactive" effort which focuses attention on those plants and animals (including fish and insects) which might otherwise drift toward a need for federal listing. This is an integral part of ecosystem management.

All native plants are important botanical

- continued on following page



Penstemon grahamii
Artist: Kaye H. Thorne

National Forest System lands or potentially affected by our management. In Region 2, 14 plant taxa were added to the sensitive species list. Twelve of these are federal candidates (C1 or C2), eight of which the botanists had not rated, and four of which the team had rated below the cut-off point they recommended. Region 2's sensitive plant list is now more inclusive than recommended by the original team of botanists. The three deletions from the list resulted from evaluation of new information using the team's criteria (e.g., Forest Service surveys found *Penstemon mensarum* to be more common and to have a wider range than previously thought, prompting the FWS to recommend dropping it from candidate

Forest Service- continued from page 8

Resources (whether or not we understand their ecological roles), so botanical expertise is critical to ecosystem management. I wish to extend a personal invitation to members of native plant societies and other botanical organizations, whether professional or amateur: Work with us to document the locations and population sizes of rare plants, to keep the natural heritage programs updated on occurrences, and to help determine how these species respond to management activities or natural processes. Share your knowledge; help our personnel identify plants accurately; become our partners.

For more information about our threatened, endangered, proposed and sensitive species program (and how you can become involved), please call our Regional Botanist, Andrew Kratz (303/275-5009), or our TES Coordinator, Joan Friedlander (303/275-5008). You can write to any of us at: USDA Forest Service, P.O. Box 25127, Lakewood, CO 80225.

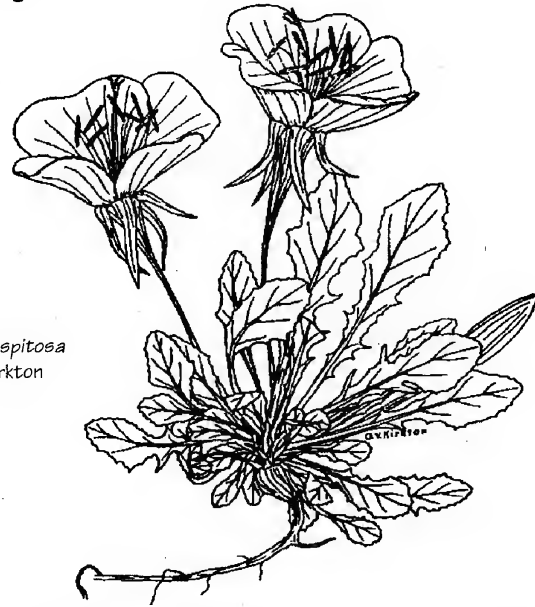


Bouteloua curtipendula
Artist: Leta Hughey

The PRESIDENT Supports Native Plants!

In April of this year, President Clinton issued a memorandum to the executive heads of federal agencies instructing them to use regionally native plants in landscaping federal facilities and in landscaping projects involving federal funds (highway and bike path projects, for example). Project designs and construction are to minimize adverse effects on natural habitats and must include water conservation elements. Use of pesticides and fertilizers, and water runoff, are to be minimized. Thank you Mr. President!

Oenothera caespitosa
Artist: O. V. Kirkton



Federal Agencies Cooperate to Strengthen Commitment to Native Plant Conservation

Excerpted from correspondence from Faith Campbell Natural Resources Defense Council

On the evening of 25 May, officials of seven federal agencies responsible, together, for managing more than 600 million acres of public land, signed a Memorandum of Understanding (MOU) to establish the Federal Native Plant Conservation Committee. Agencies signing the agreement were the U.S. Forest Service, Soil Conservation Service, Agricultural Research Service, Bureau of Land Management, National Park Service, Fish and Wildlife Service, and National Biological Survey. Senator Daniel Akaka of Hawai'i opened the proceedings.

Also signing as non-governmental cooperators were The Nature Conservancy, Center for Plant Conservation, National Association of Conservation Districts, Soil and Water Conservation Society, and Society for Ecological Restoration. (Editor's note: It may be possible for the Colorado Native Plant Society to join in the agreement; the Board of Directors will inquire about this possibility.)

As signed, the Memorandum of Understanding recognizes that:

"Native Plants are a key component of national and global biodiversity conservation efforts. Native plants and their communities

provide ecosystem functions vital to a healthy, productive, and beautiful environment. Protection and conservation of areas of highly diverse native or rare plants will benefit at-risk plants and wildlife....

Plants represent over half of all federally listed endangered and threatened species as of May, 1994. More than 450 U.S. plants are federally listed, and over 2,000 native species are Federal candidates for listing. Federal lands provide habitat for more than 200 listed plant species and one-fourth of the known occurrences of listed plants. Careful management of these lands can help maintain our nation's plant heritage...."

The MOU commits the agencies (and others expected to sign later) to forming an interagency committee that will coordinate a national native plant conservation program consisting of public education, research, conservation actions, information collection and exchange, and international programs. Federal agencies are encouraged to coordinate their efforts with state and tribal agencies and conservation organizations.

To obtain a copy of the agreement, contact Faith Campbell, Natural Resources Defense Council, 1350 New York Avenue, N.W., Washington, DC 20005.



The Denver Mint, a New Genus and Species

Joseph E. Laferrière

Herbarium, 113 Shantz Bldg, University of Arizona, Tucson

(Reprinted with permission from *Plant Science Bulletin*, a publication of the Botanical Society of America.)

In a remote mountainous area of Colorado there is a plant known by the local people as the "Denver mint." It is endemic to tailings of abandoned gold mines in the Rocky Mountains. The plant is extremely unusual in that its rectangular leaves bear portraits of famous personages in American history. These leaves are highly valued by the residents of the area because they make a passable salad. The hard, round, flat seeds bear similar portraits. This plant has been known to the local people for many years, but has never been formally classified. It is hereby described as a new member of the Lamiaceae.

Epluribus unum Laferr., *gen. et. sp. nov.* Type: United States, Colorado, Lost Dutchman Co., Cañon del Oro, 15 April 1994, I.M.A. Richman 1040 (HOLOTYPE: IRS).

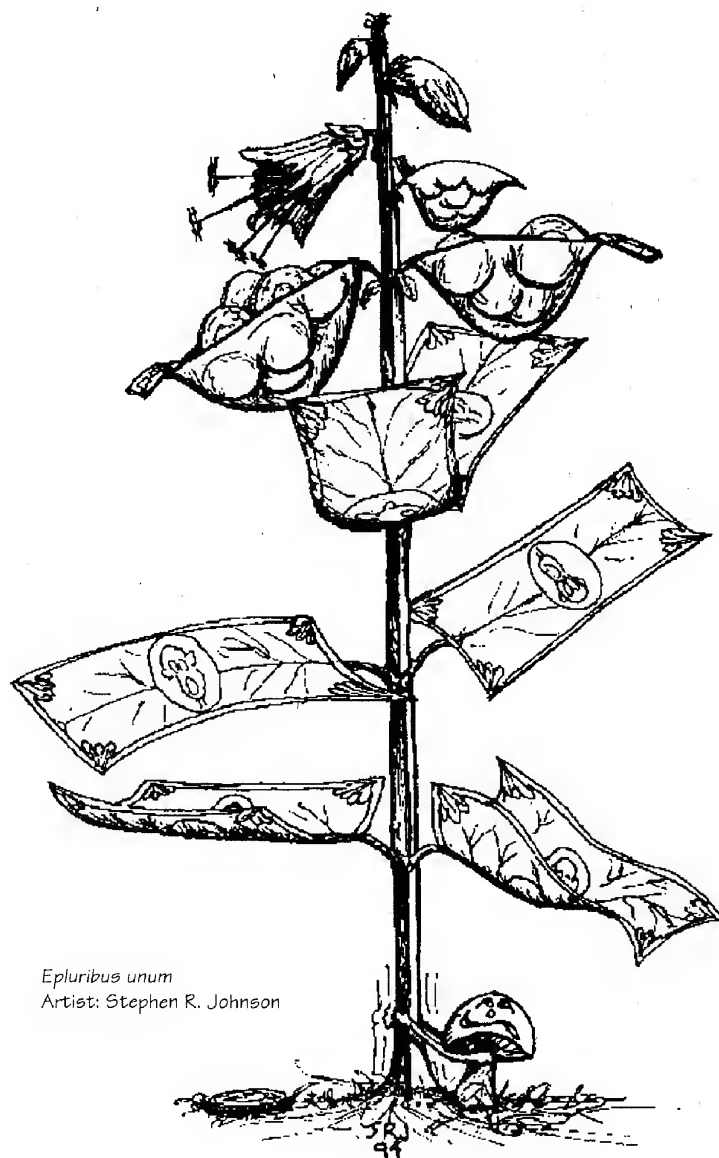
Erbhay 50 ¢m alltay. Emstay aresquay. Eaveslay ectangularray, 15.5 x 6.5 ¢m, earingbay ortraitspay ofaway amousfay ersonspay inaway Americanaway isotryhay. Uitfray ehiscntday exceptaway onaway antplay earingbay ortraitspray ofaway Enjaminbay Anklinfray. Eedssay attenedflay, ylindricalcay, earingbay upraisedaway iguresfay ofaway amousfay Americansaway andaway ethay inscriptionaway "Inaway Odgay eway usttray."

Herb 50 ¢m tall. Stem square, Leaves rectangular, 15.5 x 6.5 ¢m, bearing portraits of famous persons in American history. Fruits dehiscent except on plants bearing leaf portraits of Benjamin Franklin. Seeds flattened, cylindrical, bearing upraised figures of famous Americans and the inscription "In God we trust."

The most common leaf portraits are those of George Washington, Thomas Jefferson, Abraham Lincoln, Alexander Hamilton, and Andrew Jackson, but plants in extremely rich loam may occasionally produce portraits of Benjamin Franklin or Ulysses S. Grant. The plant will not grow in very poor soil unless fertilized with gold dust. Plants with portraits of Ulysses S. Grant also seem to prefer soil fertilized with certain distilled beverages. Leaves bearing portraits of Benjamin Franklin also abscise during thunder storms and can be carried several miles by the wind. They have been found to be particularly high in electrolytes. Hummingbirds pollinating the Denver mint have been observed to hum the song "Rocky Mountain High" during pollination. The seeds appear to be distributed by ¢ipedes.

I have been conducting genetic experiments on plants in cultivation. When plants possessing George Washington leaf portraits are crossed with those bearing portraits of Alexander Hamilton, all the F_1 progeny bear portraits of Abraham Lincoln. Plants with portraits of Thomas Jefferson were, however, found to be incompatible with those bearing portraits of Alexander Hamilton.

The plant shows promise for potential cultivation as an ornamental. I have begun a seed bank in a suid-shaped ceramic container in the hopes that the Denver mint will someday become a major cash crop.



Epluribus unum
Artist: Stephen R. Johnson



Biodiversity- continued from page 6

History: Sweet clover was planted on poor soils in the Dakotas and Canada in the early 1900s as a substitute for corn in silage. However, sweet clover was found to cause a bleeding disorder in cattle feeding on the plant; the causative agent was determined to be bishydroxycoumarin (dicumarol). The anticoagulants have since been administered to hundreds of thousands of patients annually for the prevention of harmful blood clots (Gilman).

II. DRUGS WHICH ARE USEFUL IN TREATING HEART OR CIRCULATORY DISEASES

Drug name: **Atropine and scopolamine**

Original Plant Source: The belladonna drugs are found especially in the Solanaceae, the same family to which tomatoes and potatoes belong. The atropine alkaloid comes from deadly nightshade (*Atropa belladonna*) and *Datura stramonium*. The alkaloid scopolamine is found mostly in *Hyoscyamus niger* and *Scopolia carniolica*. (Farnsworth; Gilman)

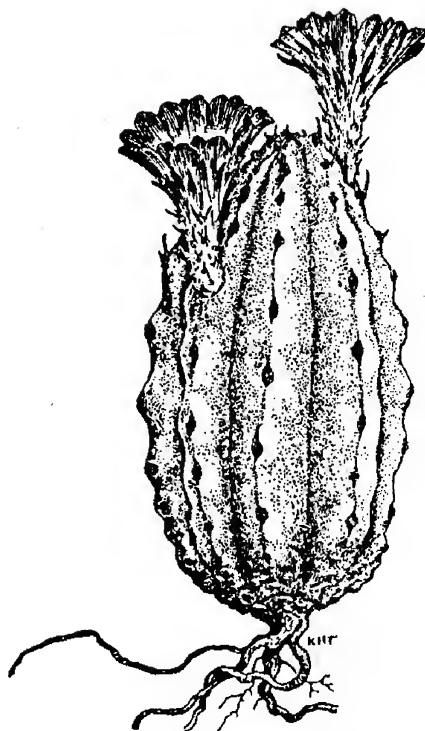
Medicinal: While principally used in the treatment of digestive and other disorders, atropine is also used to alter the rate of the heart. This is especially useful in reversing many types of slowed beating which may be caused by inhalation of irritating vapors or injection of contrast dye during cardiac catheterization. (Gilman)

History: Preparations from these plants were used by ancient Hindus and have been used by physicians for centuries. In the early 1800s, the plant alkaloids were introduced into Western medicine by British colonists. Atropine was isolated in 1831; it was shown to block the cardiac effects of central nervous system stimulation in 1867. (Gilman)

Drug name: **Lidocaine (Lignocaine)**

Original Plant Source: A Central Asian reed in the grass family (Poaceae)

Medicinal: Lidocaine was introduced in 1948 and became the most widely used local



Echinocereus triglochidiatus var. *inermis*
Artist: Kaye H. Thorne

anesthetic. In 1962, it was introduced to prevent or alleviate abnormal rhythms of the heart muscle after cardiac surgery, a heart attack or after an incorrect dosage of digitalis.

Drug name: **Quinidine gluconate and Quinidine sulfate**

Original Plant Source: *Cinchona* (*Cinchona ledgeriana*—Rubiaceae)

Medicinal: The principal use of these chemicals is in the prevention and treatment of malaria. However, they are also used to treat overly rapid contractions of the atria and irregular contractions of the ventricles (Hussar). Quinidine and other drugs in its class are effective for short and long-term treatment of irregular heart rhythms. However, this is not the case for all individuals; about one-third of the patients have adverse reactions (Gilman).

History: It was noted as early as the 1740s that patients with malaria who also had atrial fibrillation would sometimes be cured of the arrhythmia when they were given *Cinchona* (Gilman).

Drug name: **Acetylsalicylic acid (aspirin)**

Original Plant Source: White willow (*Salix alba*—Salicaceae) from Europe (Hollman)

Medicinal: Derived from salicin, its principal use is in the treatment of headache, fever and arthritis. It stands as the most widely prescribed analgesic-antipyretic and anti-inflammatory agent (Gilman). In 1992, Americans bought \$782 million worth of aspirin (Schwartz). Low doses of aspirin have strong and long-lasting effects on blood platelet adhesion and clotting, such as coronary artery diseases and postoperative clotting in the large veins of the legs. (Gilman) The most recent study, a comparison study of 300 clinical trials, showed that in low doses ($\frac{1}{2}$ aspirin per day), aspirin reduces the risk of heart attack and stroke in men and women suffering from angina, having a history of heart attacks, or preparing for arterial bypass surgery. (Collin)

SOURCES

Associated Press. High Blood Pressure Incidence Drops. The Washington Post January 18, 1994.

Collin, R. 1994. Comparison study of 300 clinical trials, reported in The British Medical Journal, as summarized by Reuters, in The Washington Post January 7, 1994.

Farnsworth, N.R. Screening Plants for New Medicines. In Wilson, E.O. Ed. 1988. Biodiversity. Washington, D.C. National Academy Press.

Gilman, A.G., T.W. Rall, A.S. Nies, P. Taylor. Eds. 1990. Goodman and Gilman's: The Pharmacological Basis of Therapeutics. Eighth Edition. New York. John Wiley.

Grever, M.R. 1993. Drug Discovery and Development from Natural Sources: The National Cancer Institute Experience. Testimony before the Subcommittee on Environment and Natural Resources, House Committee on Merchant Marine and Fisheries, November 9, 1993.

Hussar, D.A. Ed. 1993. Modell's Drugs in Current Use and New Drugs. 39th Edition. New York. Springer.

Hollman, A. Cardiology from Nature.

Oldfield, M.L. 1984. The Value of Conserving Genetic Resources. Washington, D.C. U.S. Department of Interior, National Park Service.

Schwartz, J. 1994. FDA Approves Over-Counter Pain Reliever. The Washington Post January 12, 1994.



CALENDAR OVERVIEW

Florissant Fossil Beds Anniversary Series

(See page 3 for more information)

August 27 HISTORY OF THE GOLD BELT *
with Doris Wolfe

September 3 ROCKS OF AGES
with Bill Dexter

September 10 STORYTELLING
with John Stansfield

September 17 LIFE HISTORY OF THE ELK
with Jack Vayhinger

Field Study at Lory State Park

(See page 3 for more information)

September 15, 17, 22

Colorado Native Plant Society Annual Meeting

(See page 2 for more information)

October 15, Fort Collins



Colorado Native Plant Society
P.O. Box 200
Fort Collins, Colorado 80522



Aquilegia barnebyi
Artist: Kaye H. Thorne

Non-profit
Organization
U.S. Postage
PAID
Permit #1475
Denver, Colorado